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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,644	02/20/2004	Won nam Kang	1751-301.CON	3455

6449 7590 05/22/2006

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EXAMINER

TALBOT, BRIAN K

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/781,644

Applicant(s)

KANG ET AL.

Examiner

Brian K. Talbot

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1762

1. The Request for Consideration as well as the perfected Affidavit filed 3/20/06 has been considered and entered. Claims 1-8 remain in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. The Affidavit was perfected to withdraw Cheong et al. (6,878,420) as a reference.
4. In light of the arguments filed 3/20/06, the rejection over Finnemore et al. (6,514,557 B2) has been withdrawn.

Claim Rejections - 35 USC § 103

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finnemore et al. (6,514,557 B2) in combination with Thieme et al. (7,018,954).

Finnemore et al. (6,514,557 B2) teaches synthesis of superconducting magnesium diboride objects. Boron objects are reacted with magnesium vapor for a predetermined time and temperature to form a magnesium diboride object (see abstract). The boron object can be a wire, filament or boron film atop a substrate heated up to near 950°C and then cooled to form the MgB₂ object. The process to form the film is by pulsed laser deposition (Figs. 1a,1b, col. 3, lines 35-47 and claims 9-11). The chamber for which the heating is performed is a tantalum tube on the inside and sealed with quartz on the outside and the heating is performed in an inert

Art Unit: 1762

atmosphere (col. 2, lines 6-18). Finnemore et al. (6,514,557 B2) teaches sealing the boride film in an inert tube and sealing the inert tube in quartz (see Fig. 1b). The heating time varies dependent upon the thickness of the boron film and it less than 120 minutes. The substrate can be strontium titanate and the heating time can be as low as 30 minutes for a one micrometer boron film (col. 3, lines 35-45).

Finnemore et al. (6,514,557 B2) fails to teach the substrate being monocrystalline strontium titanate.

Thieme et al. (7,018,954) teaches MGB2 superconductors whereby a boron layer is formed on a single crystal substrate and subsequently post-treated with magnesium to form a MGB2 film. The boron layer can be applied by a variety of ways including plasma sputtering, laser ablation and CVD (col. 4, lines 5-60 and col. 11, lines 35-65). The crystalline substrate enables the growth of the MGB2 film to be crystalline as the grown film closely matches the crystal structure of the substrate. The substrate is tantalum, copper, aluminum, as well as other metal and metal alloys can be used (col. 2, lines 20-65).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Finnemore et al. (6,514,557 B2) process by utilizing a crystalline substrate as evidenced by Thieme et al. (7,018,954) with the expectation of achieving a c-axis crystalline orientation coating having a higher critical density as a result of the crystalline nature of the substrate.

Response to Amendment

6. Applicant's arguments filed 3/20/06 have been fully considered but they are not persuasive.

Applicant argued that the prior art fails to teach a single crystal substrate structure.


Thieme et al. (7,018,954) teaches this limitation as noted above. While the Examiner acknowledges the fact that Thieme et al. (7,018,954) fails to specifically teach the claimed sapphire or strontium titanate substrate, Thieme et al. (7,018,954) does teach the use of metal or metal alloy substrates and it is the Examiner's position that the claimed substrate are commonplace in the superconductive art. In addition, absent a showing of unexpected results, it is the Examiner's position that the magnesium diboride coating would be similar regardless of the material make-up of the substrate as long as it has a single crystal structure. If Applicant disagrees and there is some criticality regarding the material, i.e. single crystal sapphire substrate would produce a different magnesium diboride coating than a single crystal copper substrate would, the Examiner will reconsider his position.

Art Unit: 1762

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 5/18/06
Brian K Talbot
Primary Examiner
Art Unit 1762

BKT